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Altogether, seven major reports on boron, including one by Kedrov-Zikhman, and a number of secondary reports on the same subject have been presented at the meeting. In these reports it was brought out that boron is especially effective under the conditions of calcination of acidic podzol soils. Boron contributes to an increase of the chlorophyll content of leaves and stimulates photosynthesis, as well as the reduction processes in the plant organism. It influences the carbohydrate metabolism, stimulating the flow of carbohydrates from the leaves to the reproductive organs. This effect is brought about through action on the enzymatic system, as could be demonstrated by supplying boron in the form of external dusts and sprays rather than through the roots. Some species of plants need boron greatly while others do not. Pronounced differences could be established experimentally in the nitrogen, phosphorus, and potassium metabolism of flax, which has a great need for boron, as compared with wheat, which does not require boron to such an extent.

Boron fertilizers are used to combat the following plant diseases: core rot and hollowness of the roots of sugar beets and other root crops, scab of potato tubers, and bacteriosis of flax.

The action of boron fertilizers induces changes in the biological characteristics of seeds, so that the seeds are increased in size and weight, and have improved qualities as far as the percentage of sprouting and the rate and vigor of sprouting and growth are concerned. The use of boron is of particular advantage in the cultivation (for the production of seed) of clover, alfalfa, sugar beets (on podzol soil), vegetables, feed-root crops, and kok-sagyz. It has been planned to increase the use of boron fertilizers in USSR agriculture from 2,000 tons (referred to boric acid) in 1950 to 6,000 tons in 1952.

M. Ya. Shkol'nik stated, in an extensive report entitled "The Physiological Role of Trace Elements in Plants" that the positive action of B, Mn, Zn, and Cu in photosynthesis has been established, and that Co and Mn participate in the synthesis of vitamins.

Academician P. A. Vlasjuk stated in his report that the application and dosage of manganese have been investigated on the following crops planted on Ukrainian, Georgian, and Bashkir soils: sugar beets, beet transplants, winter wheat, perennial weeds, strawberry, wild strawberry, and tobacco. On the basis of this and other reports, the conference made recommendations aimed at the universal introduction of manganese fertilizers into USSR agricultural practice. It was pointed out that the residue remaining after the treatment of manganese ore, as well as by-products like manganese sludge and manganese sulfate, can serve as crude materials for the production of manganese fertilizers. On the basis of the quantitative relationships worked out for various crops and various soils, it was brought out that cotton, sugar beets, perennial weed blends, cereal grains, vegetables, fruit, and berries ought to be fertilized with manganese before other crops, when this type of fertilization is generally introduced. On the basis of work already done, the study and application of the treatment of seed at the time of vernalization (i.e., before planting), with manganese salts were suggested.

In regard to diseases of farm animals caused by cobalt deficiency, the conference recommended that copper be fed to the animals in addition to cobalt, and that in the areas which are affected by the diseases in question, pyrite roasting residues containing cobalt and copper be used as fertilizer. In the treatment of the cobalt deficiency disease called "sukhotka" /narasmus/, copper catalyzes cobalt as far as stimulation of blood formation is concerned. The treatment recommended in this case is based on a report by Ya. M. Berzin.

In the course of a report entitled "Physiological Significance of Copper for Plants and Application of Copper Fertilizers in Agricultural Practice", M. M. Okuntsov pointed out that in addition to Belorussia, where copper fertilization is already being successfully applied, swamp and peat soils which are

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poor in copper, cover extensive areas in other parts of the USSR, particularly the Ukraine and Siberia. According to Okuntsov, a very good method of supplying copper to plants is treatment of the seeds with a solution of a copper salt during vernalization. This type of treatment increases resistance of plants to low temperatures, which would be very important in Siberia, Okuntov added.

A number of reports was devoted to the action of copper fertilizers on cultures like potatoes and kok-sagyz, both under experimental and field conditions. Thus, A. S. Okanenko and L. K. Ostrovskaya presented a paper dealing with the effect which copper has on the oxidative enzyme system of kok-sagyz growing on peat soil.

A decision of the conference in regard to copper fertilizers emphasized that, in connection with the increased utilization of peat swamps for agricultural purposes in the USSR, a development which during the next five years will have included a million of hectares, large quantities of copper must be introduced into the soil, and that consequently an evaluation of crude materials containing copper, ores and industrial wastes like pyrite roasting residues, ought to be carried out from that point of view.

The conference indicated in one of its decisions that further investigation of the role which natural radioactive elements, potassium, uranium, and thorium, play in living organisms seems to be desirable, because former work has already shown that these elements exert a definite effect on physiological processes in plants. Moreover, the results of such investigations will form the basis for the application of radioactive fertilizers in agriculture.

In the light of the decisions taken by the conference, the use of radioactive tracer elements in connection with the research which has been discussed and planned seems to be especially promising.

The conference also recommended that the whole territory of the USSR be investigated as far as the content of trace elements in the soil is concerned, and that the results be mapped; that the combined effects of copper, manganese, and boron on crops be studied; that a scientific basis for applying microelements in the cultivation of forest trees, citrus trees, and other plants be developed; that the role of microelements in the appearance of hitherto uninvestigated endemic diseases of the NZ group that affect cattle be studied; and that the effect which microelements have on the resistance of animals and plants to other diseases be investigated.

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